Remarks

This Amendment is responsive to the Office Action of **May 13, 2005**. Reexamination and reconsideration of **claims 1 and 3-39** is respectfully requested.

Summary of The Office Action

Claims 1-7, 10-15, 22-36 and 38-89 were rejected under 35 U.S.C. § 102(b) as being anticipated by Field et al. (US Pat. 6,062,681).

Claims 9 and 37 were rejected under 35 USC 103(a) as being unpatentable over Field et al. (US Pat. 6,062,681) in view of Masaki (US Pat. 6,109,715).

Claims 16-21 were rejected under 35 USC 103(a) as being unpatentable over Field et al. (US Pat. 6,062,681) in view of Sullivan (US Pat. 6,264,309).

The Present Amendment

Drawings

The drawings were objected to under 37 CFR 1.83(a) as failing to show the recitations "electrical components", "transistors", and "piezoelectric crystals" as recited in claims 6-9, 11, 14, 28, 30, 33, 35, and 36-39. In paragraph [0040], however, it is clear that electrical components include resistors 313, which are shown in FIGS. 4 and 5 of the drawings. Electrical components, therefore, are shown in the drawings.

Additionally, as is clear from paragraph [0073] of the specification, the transistor and piezoelectric crystals are different embodiments of the electrical components, and are conventional features. As these are design alternatives, it is not necessary to show each one in the drawings. 35 U.S.C. §113. MPEP 608.02(d) and 37 CFR 1.83(a) state that conventional features need not be separately illustrated. Accordingly, the features "electrical components,"

"transistors," and "piezoelectric crystals" are represented in the drawings as element 313 and additional components are not essential for a proper understanding of the invention (MPEP 608.02(d)). Therefore, Applicants respectfully request withdrawal of the objection to the drawings.

The Present Claims Patentably Distinguish Over the References of Record

Independent Claim 1

Claim 1 has been amended to clarify that the second set of resistors are configured to move bubbles present in the fluid to prevent occluding of the ejection chambers. Accordingly, claim 2 has been canceled. **Claim 1** now recites that a second set of resistors primarily configured to be cooperatively energized sufficiently to heat fluid but not primarily to eject the fluid that causes bubbles present in the fluid to move to prevent occluding of the ejection chambers, the second set of resistors positioned along a fluid feed passageway supplying the ejection chambers. No new matter has been added by means of this amendment. Support for this amendment can be found, among other places, on page fifteen, paragraph [0057] of the specification.

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field et al. (U.S. Patent No. 6,062,681) (hereinafter "Field"). Field, however, is very different from the present systems and method. For example, Field fails to teach or suggest a second set of resistors that move bubbles present in the fluid to prevent occluding of the ejection chambers as recited in **claim 1**.

Field discloses a bubble valve and bubble valve regulator. As shown in FIGS. 1C-1H and disclosed in column 9, lines 35-47, the upstream heater **34** and the downstream heater **35** nucleate the bubble to control its size and its position relative to the constriction **32**. As stated in column 10, lines 1-30, the bubble created and positioned by the upstream heater **34** and downstream heater **35** purposely blocks the flow of ink through the constriction **32** to either increase the pressure or to block the flow in its entirety. Field, therefore, discloses using heaters to move a bubble to fully or partially block the flow of fluid. This is the opposite of **claim 1**.

Claim 1 requires that the second set of resistors move the bubbles in the fluid to prevent occluding of the ejection chambers.

In addition, the third embodiment of Field, which includes a bubble valve, fails to disclose a second set of resistors that move bubbles present in the fluid to prevent occluding of the ejection chambers. As shown in FIGS. 5A-5D of Field, the print cartridge includes a bubble extractor **270** that prevents the flow of ink (see also column 18, lines 52-65). The bubble extractor **270**, therefore, does not have fluid flowing therethrough. Accordingly, the heaters **284** and **285** do not move bubbles present in the fluid, as the heaters do not operate on any fluid. Additionally, heaters **284** and **285** do not prevent occluding of the ejection chambers. They instead eject the bubble from the valve (see column 19, lines 33-57).

Since **claim 1** recites features not disclosed by the reference, **claim 1** patentably distinguishes over the reference. Accordingly, dependent **claims 3-4** also patentably distinguish over the reference and are in condition for allowance.

Independent Claim 5

Claim 5 has been amended to clarify that the means for moving a bubble in a desired direction along the fluid-feed path prevents the bubble from occluding the fluid feed path. No new matter has been added by means of this amendment.

Claim 5 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. As previously explained, Field fails to disclose a means for moving a bubble in a desired direction along the fluid-feed path to prevent the bubble from occluding the fluid feed path. Since **claim 5** recites features not disclosed by the reference, **claim 5** patentably distinguishes over the reference and is in condition for allowance.

Independent Claim 6

Claim 6 has been amended to clarify that the second set of electrical components are primarily configured to be cooperatively energized sufficiently to heat fluid to maintain fluid flow to the ejection chamber. No new matter has been added by means of this amendment.

Claim 6 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. As previously explained, Field fails to disclose a second set of electrical components that are configured to be cooperatively energized sufficiently to heat fluid to maintain fluid flow to the ejection chamber. Since **claim 6** recites features not disclosed by the reference, **claim 6** patentably distinguishes over the reference. Accordingly, dependent **claim 7** also patentably distinguishes over the reference and is in condition for allowance.

Independent Claim 11

Claim 11 is directed to multiple electrical components configured to be energized at a first intensity sufficient to vaporize fluid for ejection from individual ejection chambers of a micro electro mechanical systems device, and configured to be cooperatively energized at a second lower intensity sufficient to heat fluid without vaporizing the fluid in a bubble moving pattern designed to move a bubble contained in the fluid in a desired direction.

Claim 11 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. Field, however, does not disclose multiple electrical components configured to be both energized at a first intensity and at a second lower intensity as required by **claim 11**. As shown in FIG. 1A of Field, there are three separate electrical components, the firing element 6 and the upstream and downstream heaters 34 and 35. As disclosed in column 8, lines 15-29 the firing element 6 causes the ejection of ink from the orifice 7. As disclosed in column 9 and 10, lines 49-67 and 1-30, the heaters 34 and 35 causes the bubble to move. It is clear, therefore, that none of the electrical components of Field are configured to be both energized at a first intensity and at a second lower intensity in a bubble moving pattern as required by **claim 11**. The components of Field are limited to one function.

Since **claim 11** recites features not disclosed by the reference, **claim 11** patentably distinguishes over the reference. Accordingly, dependent **claims 12-13** also patentably distinguish over the reference and are in condition for allowance.

Independent Claim 14

Claim 14 has been amended to clarify that individual ones of the second electrical components are configured to be energized in a pattern designed to move a bubble contained in the fluid-feed channel in a desired direction to prevent the bubble from obstructing flow of the individual ejection chamber. No new matter has been added by means of this amendment.

Claim 14 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. As previously explained, Field fails to disclose individual ones of the second electrical components are configured to be energized in a pattern designed to move a bubble contained in the fluid-feed channel in a desired direction to prevent the bubble from obstructing flow of the individual ejection chamber. Since **claim 14** recites features not disclosed by the reference, **claim 14** patentably distinguishes over the reference. Accordingly, dependent **claims 15** and **22** also patentably distinguish over the reference and are in condition for allowance.

Independent Claim 23

Claim 23 has been amended to clarify that moving a bubble that existed prior to the energizing in a desired direction within the micro electrical mechanical systems device to prevent the bubble from restricting the flow of the fluid. No new matter has been added by means of this amendment.

Claim 23 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. As previously explained, Field fails to disclose moving a bubble that existed prior to the energizing in a desired direction within the micro electrical mechanical systems device to prevent the bubble from restricting the flow of the fluid. Since **claim 23** recites features not disclosed by the

reference, **claim 23** patentably distinguishes over the reference. Accordingly, dependent **claims 24-29** also patentably distinguish over the reference and are in condition for allowance.

Independent Claim 30

Claim 30 has been amended to clarify that responsive to the energizing, moving a thermal gradient along the fluid to move the bubble in a desired direction to maintain flow of the fluid. No new matter has been added by means of this amendment.

Claim 30 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. As previously explained, Field fails to disclose responsive to the energizing, moving a thermal gradient along the fluid to move the bubble in a desired direction to maintain flow of the fluid. Since **claim 30** recites features not disclosed by the reference, **claim 30** patentably distinguishes over the reference. Accordingly, dependent **claims 31 and 32** also patentably distinguish over the reference and are in condition for allowance.

Independent Claim 33

Claim 33 has been amended to clarify that second energizing at least one electrical component of a second set of electrical components primarily to move a bubble contained in a fluid prevents the bubble from blocking ejection of the fluid from the micro electro mechanical systems device. No new matter has been added by means of this amendment.

Claim 33 was rejected under 35 U.S.C. § 102(b) as being anticipated by Field. As previously explained, Field fails to disclose a second energizing at least one electrical component of a second set of electrical components primarily to move a bubble contained in a fluid prevents the bubble from blocking ejection of the fluid from the micro electro mechanical systems device. Since **claim 33** recites features not disclosed by the reference, **claim 33** patentably distinguishes over the reference. Accordingly, dependent **claims 34-36 and 38-39** also patentably distinguish over the reference and are in condition for allowance.

35 USC §103 Rejections

Claims 9 and 37 were rejected under 35 USC 103(a) as being unpatentable over Field in view of Masaki (US Pat. No. 6,109,715) (hereinafter "Masaki"). However, as argued above independent **claims 6 and 33** recite features not disclosed by Field, the primary reference. Masaki fails to cure the shortcomings of Field. Therefore, **claims 9 and 37** also patentably distinguish over Field in view of Masaki and are in condition for allowance.

Claims 16-21 were rejected under 35 USC 103(a) as being unpatentable over Field in view of Sullivan (US Pat. No. 6,264,309) (hereinafter "Sullivan"). However, as argued above independent **claim 14** recites features not disclosed by Field, the primary reference. Therefore, **claims 16-21** also patentably distinguish over Field in view of Sullivan and are in condition for allowance. **Claims 19 and 20** were amended to remove superfluous language and to correct the dependencies thereof. No new matter was added by means of these amendments.

Conclusion

For the reasons set forth above, **claims 1 and 3-39** patentably and unobviously distinguish over the references of record and are now in condition for allowance. An early allowance of all claims is earnestly solicited.

Respectfully submitted,

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